Case challenge

A 70-year-old gentleman suffered from progressive chest tightness and heartburn for six months

Division of Gastroenterology and Hepatology.
Veteran General Hospital Taichung.
Dr. Ming-Hsien. Lin.
General data

• Name : Wu *** Tung
• Birthday : 22, Mar, 1943
• Age : 70 years old
• Gender : Male
• Marriage : Married
• Race : Hokkien
• Occupation: Farmer, retired, with interest in gardening before the symptom
• Residence : Changhua
• Past history:
  – Hypertension
  – Traumatic intracerebral hematomas, 15 years ago
  – Non ruptured saccular aneurysm over the left distal ICA at the level of left posterior communicating artery origin

• Personal history
  – Smoking: Nil
  – Alcohol: Nil
  – Vaccine history: Nil
  – Stressful life event: Nil
• Family history:
  – Father: acute myocardial ischemia, expired
  – 兄: 5, 弟: 4, 姐: 1, 妹: 1, 兒子: 2, 女兒: 1

• Medication: Plavix, Lipitor, Co-diovan, Lasix
• No allergy to drug, food, environmental substance
• No travel history
• No contact history

• Height: 168.9 cm
• Weight: 75.8 kg
• BP: 115/71 mmHg
• PR: 111/min
Q1. How to approach a patient with chest pain/chest tightness
# Differential diagnoses of patients with acute chest discomfort

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<tr>
<th>Diagnosis</th>
<th>Percent</th>
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<tr>
<td><strong>Gastroesophageal diseasea</strong> (In order of frequency)</td>
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<tr>
<td>Gastroesophageal reflux</td>
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<tr>
<td>Esophageal motility disorders</td>
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<td>Peptic ulcer</td>
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<td>Gallstones</td>
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<td>Ischemic heart disease</td>
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<td>Chest wall syndromes</td>
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<td>Pericarditis</td>
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<td>Pulmonary embolism</td>
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<td>Lung cancer</td>
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<td>Aortic aneurysm</td>
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<td>Aortic stenosis</td>
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<td>Herpes zoster</td>
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## Typical clinical features of acute chest discomfort

<table>
<thead>
<tr>
<th>Condition</th>
<th>Duration</th>
<th>Quality</th>
<th>Location</th>
<th>Associated features</th>
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<tbody>
<tr>
<td>Angina</td>
<td>More than 2 and less than 10 min</td>
<td><strong>Pressure, tightness, squeezing, heaviness, burning</strong></td>
<td>Retrosternal, often with radiation to or isolated discomfort in neck, jaw, shoulders, or arms—frequently on left</td>
<td>Precipitated by exertion, exposure to cold, psychologic stress S4 gallop or mitral regurgitation murmur during pain</td>
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<tr>
<td>Unstable angina</td>
<td>10–20 min</td>
<td>Similar to angina but often more severe</td>
<td>Similar to angina</td>
<td>Similar to angina, but occurs with low levels of exertion or even at rest</td>
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<tr>
<td>Acute myocardial infarction</td>
<td>Variable; often more than 30 min</td>
<td>Similar to angina but often more severe</td>
<td>Similar to angina</td>
<td>Unrelieved by nitroglycerin May be associated with evidence of heart failure or arrhythmia</td>
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<tr>
<td>Aortic stenosis</td>
<td>Recurrent episodes as described for angina</td>
<td>As described for angina</td>
<td>As described for angina</td>
<td>Late-peaking systolic murmur radiating to carotid arteries <strong>Angina, syncope, heart failure</strong></td>
</tr>
</tbody>
</table>

*Harrison. 17ed*
<table>
<thead>
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<th>Condition</th>
<th>Duration</th>
<th>Quality</th>
<th>Location</th>
<th>Associated features</th>
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</thead>
<tbody>
<tr>
<td>Pericarditis</td>
<td>Hours to days; may be episodic</td>
<td>Sharp</td>
<td>Retrosternal or toward cardiac apex; may radiate to left shoulder</td>
<td>May be relieved by sitting up and leaning forward Pericardial friction rub</td>
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<tr>
<td>Aortic dissection</td>
<td>Abrupt onset of unrelenting pain</td>
<td>Tearing or ripping sensation; knifelike</td>
<td>Anterior chest, often radiating to back, between shoulder blades</td>
<td>Associated with hypertension and/or underlying connective tissue disorder, e.g., Marfan syndrome Murmur of aortic insufficiency, pericardial rub, pericardial tamponade, or loss of peripheral pulses</td>
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<tr>
<td>Pulmonary embolism</td>
<td>Abrupt onset; several minutes to a few hours</td>
<td>Pleuritic</td>
<td>Often lateral, on the side of the embolism</td>
<td>Dyspnea, tachypnea, tachycardia, and hypotension</td>
</tr>
<tr>
<td>Pulmonary HTN</td>
<td>Variable</td>
<td>Pressure</td>
<td>Substernal</td>
<td>Dyspnea, signs of increased venous pressure including edema and jugular venous distention</td>
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<tr>
<td>Pneumonia or pleuritis</td>
<td>Variable</td>
<td>Pleuritic</td>
<td>Unilateral, often localized</td>
<td>Dyspnea, cough, fever, rales, occasional rub</td>
</tr>
<tr>
<td>Spon. Pneumothorax</td>
<td>Sudden onset; several hours</td>
<td>Pleuritic</td>
<td>Lateral to side of pneumothorax</td>
<td>Dyspnea, decreased breath sounds on side of pneumothorax</td>
</tr>
<tr>
<td>Condition</td>
<td>Duration</td>
<td>Quality</td>
<td>Location</td>
<td>Associated features</td>
</tr>
<tr>
<td>----------------------------</td>
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<td>--------------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Esophageal reflux</td>
<td>10–60 min</td>
<td><strong>Burning</strong></td>
<td>Substernal, epigastric</td>
<td>Worsened by postprandial recumbency Relieved by antacids</td>
</tr>
<tr>
<td>Esophageal spasm</td>
<td>2–30 min</td>
<td><strong>Pressure, tightness, burning</strong></td>
<td>Retrosternal</td>
<td>Can closely mimic angina</td>
</tr>
<tr>
<td>Peptic ulcer</td>
<td>Prolonged</td>
<td><strong>Burning</strong></td>
<td>Epigastric, substernal</td>
<td>Relieved with food or antacids</td>
</tr>
<tr>
<td>Gallbladder disease</td>
<td>Prolonged</td>
<td><strong>Burning, pressure</strong></td>
<td>Epigastric, right upper quadrant, substernal</td>
<td>May follow meal</td>
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<tr>
<td>Musculoskeletal disease</td>
<td>Variable</td>
<td>Aching</td>
<td>Variable</td>
<td>Aggravated by movement May be reproduced by localized pressure on examination</td>
</tr>
<tr>
<td>Herpes zoster</td>
<td>Variable</td>
<td>Sharp or burning</td>
<td>Dermatomal distribution</td>
<td>Vesicular rash in area of discomfort</td>
</tr>
<tr>
<td>Emotional and psychiatric conditions</td>
<td>Variable; may be fleeting</td>
<td>Variable</td>
<td>Variable; may be retrosternal</td>
<td>Situational factors may precipitate symptoms Anxiety or depression often detectable with careful history</td>
</tr>
</tbody>
</table>
Q2. How do you approach a patient with heartburn
Heartburn (pyrosis, 灼熱)

• Synonyms?
  – Indigestion (消化不良), acid regurgitation (胃酸逆流), sour stomach (胃酸過多), and bitter belching (苦噯氣).

• A burning feeling rising from the stomach or lower chest up toward the neck.
  • A word-picture description increases the ability to identify patients with reflux.
  – Begins inferiorly and radiates up the entire retrosternal area to the neck, occasionally to the back, and rarely into the arms.
  • May be relieved, albeit only transiently, by the ingestion of antacids, baking soda, or milk.

Presentation of functional dyspepsia

- Heartburn
- Early satiation
- Postprandial fullness
- Epigastric pain
- Epigastric burning
- Upper abdominal bloating
- Nausea
- Vomiting

Montreal consensus, 2006

GERD is a condition which develops when the reflux of gastric content causes troublesome symptoms or complications

Most common symptoms: heartburn, regurgitation, and dysphagia
Others symptoms: chest pain, water brash, globus sensation, odynophagia, and nausea.
Extraesophageal symptoms: bronchospasm, laryngitis, and chronic cough

包含NERD, Epigastric pain
定位不明:
Hypersensitivity syndromes ?
Functional HB ?

Vakil NT, AIG 2006
Differential diagnosis of GERD

- Achalasia
- Zenker's diverticulum
- Gallstones
- Peptic ulcer disease
- Functional dyspepsia
- Other etiologies of esophagitis
  - Pills, infections, or radiation
  - Considered in difficult-to-manage cases, older individuals, or immunocompromised patients.

Angina pectoris

Gastroparesis
Q3. What’s your suggestion for the next step
-2013. 03. 28  Taichung Veterans General Hospital
GI OPD

In recent one month
Progressive abdominal distention with edema over bilateral lower extremity. Poor appetite and loss of body weight (88->71 kg in 6 months).
Fever, chills, night sweating, cough, and hemoptysis were denied.
Q4. Can you find out the most possible cause of the chronic, abdominal distension by physical examination?
Physical examination of liver

- Presence of chronic liver disease
  - Temporal and proximal muscle wasting suggest longstanding disease
  - Stigmata of liver disease include spider nevi, palmar erythema, gynecomastia, and caput medusae
  - Dupuytren's contractures, parotid gland enlargement, and testicular atrophy are commonly seen in advanced alcoholic cirrhosis and occasionally in other types of cirrhosis
  - Ascites or hepatic encephalopathy may be seen in patients with decompensated cirrhosis
– An enlarged left supraclavicular node (Virchow's node) or periumbilical nodule (Sister Mary Joseph's nodule) suggest an abdominal malignancy

– Increased jugular venous pressure, a sign of right-sided heart failure, suggests hepatic congestion

– A right pleural effusion, in the absence of clinically apparent ascites, may be seen in advanced cirrhosis

– Neurologic signs and symptoms may be seen in patients with Wilson disease

– The abdominal examination should focus on the size and consistency of the liver, the size of the spleen (a palpable spleen is enlarged), and an assessment for ascites (usually by determining whether there is a fluid wave, shifting dullness, or bulging of the flanks).
- Patients with cirrhosis may have an enlarged left lobe of the liver (which can be felt below the xiphoid) and an enlarged spleen (which is most easily appreciated with the patient in the right lateral decubitus position).
- A grossly enlarged nodular liver or an obvious abdominal mass suggests malignancy.
- An enlarged, tender liver could be due to viral or alcoholic hepatitis or, less often, an acutely congested liver secondary to right-sided heart failure or Budd-Chiari syndrome.
- Severe right upper quadrant tenderness with a positive Murphy's sign (respiratory arrest on inspiration while pressing on the right upper quadrant) suggests cholecystitis or, occasionally, ascending cholangitis.
- Ascites in the presence of jaundice suggests either cirrhosis or malignancy with peritoneal spread.
Abdominal Venous Hum

- In the supine position.
- A continuous roaring or whining noise, which may be localized to the abdomen or may radiate into the chest. (light pressure with bell or diaphragm of the stethoscope)
- Unlike the cervical venous hum, the response of the abdominal venous hum to change in position, respiration, cardiac cycle, or the Valsalva maneuver is unpredictable.

- In portal vein hypertension → Collateral venous channels are opened between the portal and the systemic venous channels.
- From a congenitally atrophic liver and patent umbilical vein → Cruveilhier–Baumgarten disease.
- From cirrhosis of the liver or other causes → Cruveilhier–Baumgarten syndrome.

Walker HK, Clinical Methods: The History, Physical, and Laboratory Examinations. 1990
Hepatic Arterial Bruit

- In the supine position.
- An arterial bruit may be confined to systole or be systolic with extension into diastole or be continuous.
  - There are many causes of abdominal arterial bruits. If the liver is large and the stethoscope is placed directly over it and the bruit is not heard at locations away from the liver, the odds are greatly in favor of the bruit coming from the liver. (moderately firm pressure with either the bell or the diaphragm of the stethoscope)

- **Alcoholic hepatitis or primary or metastatic cancer.** Though reported to occur in cirrhosis of the liver, it is rare without associated alcoholic hepatitis. An abdominal venous hum and a hepatic arterial bruit in the same patient would suggest cirrhosis of the liver with alcoholic hepatitis or cancer.

*Walker HK, Clinical Methods: The History, Physical, and Laboratory Examinations. 1990*
Hepatic Friction Rub

– In the supine position.
– Light pressure of the examining hand is used to feel a thrill over the liver which is related to respiration. If felt, a friction rub will be heard, but a rub more often is heard and not felt.
– If the rub is being produced by movement of the liver, the rub will usually be confined to the abdomen and will not radiate into the chest. Likewise a friction rub caused by movement of the pleura will not be heard over the liver.
  • Dual blood supply of hepatic artery and portal vein rarely develops an infarction large enough to produce a rub.
– Most hepatic rubs result from inflammation of the liver or contiguous structures, the commonest causes being infection and cancer, either primary or metastatic.

Walker HK, Clinical Methods: The History, Physical, and Laboratory Examinations. 1990
Physical examination on 2013,04,14

- BT: 36°C, HR: 112 beats/min, RR 20 times/min.
- BP: 148/81mmHg, BH: 167cm, BW 73.11 kg
- HEENT:
  - No specific nodules. No specific icteric. No pale conjunctiva. No thyroid enlargement. No engorgement of jugular vein.
- Skin
  - Normal skin turgor and moisture. No jaundice.
- Chest:
Physical examination on 2013,04,14

- Abdomen:
- Extermities:
  - Pitting edema grade 2-3
-2012. 09  Chest tightness over anterior wall
            Followed by abdominal fullness
-2012. 09 ~ Changhua Christian Hospital, CM OPD
            Impression: suspect pneumonia
-2012. 10. 15 Abdomen CT
            Suspect pericarditis with massive pericardial effusion
-2012. 10. 18 Chest CT
            Moderate amount of pericardial effusion with prominent pericardial and epicardium thickening and enhancement. Pericarditis is favored.
-2013. 02. 06 Throcentesis
-2012. 10. 16  Pleural TB culture: Negative.
-2012. 10. 19  Serial admission and management
Latest discharge diagnosis
1. Restrictive pericarditis with pericardial effusion and pleural effusion
2. Gastroesophageal reflux disease, LA grade A
3. Hypertension
4. Cerebral aneurysm
5. Vertebralbasilar artery syndrome
6. Cervical spondylosis with osteophyte formation
7. Hyperlipidemia
-2013. 02. 06  Pleural TB culture: Negative.
Q5. What’s your suggestion for the next step
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<th>DATE</th>
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<th>TP</th>
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<th>BAND</th>
<th>SEG</th>
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<td>14.5</td>
<td>47.3</td>
<td>33.4</td>
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</table>
ACTH : 29.0 pg/mL  
(ND-46 pg/mL)
Cortisol: 26.1 ug/dl  
(AM 5-25 ug/dl  
PM half of AM)
TSH : 1.88 uIU/ml  
(0.4-4.0 uIU/ml)
Free T4 : 13.0 pg/ml  
(8.9 - 17.6 pg/ml)

CEA : 2.41 ng/ml  
(< 5.0 ng/ml)
AFP : 1.98 ng/ml  
(< 12 ng/ml)
HBsAg : 0.454 (-)
Anti-HBsAb: 20.44 IU/L (+)
Anti-HCV : 0.115 (-)
ANA : Negative
1. Liver parenchymal disease
2. GB stone
3. Suspect renal hemangioma, LK
4. Suboptimal study of pancreas
5. Much ascites, s/p tapping 60 cc for survey
1. POOR ACOUSTIC WINDOW IN PARASTERNAL VIEW
2. LA (4.0 CM) CHAMBER DILATATION
3. CONC. LVH (1.2, 1.1 CM)
4. DILATED PA TRUNK (-- 2.7 CM) WITH MILD PR
5. AORTIC VALVE THICKENED WITH MINIMAL AR
6. MILD TR WITH PEAK SYSTOLIC PG -- 26 MMHG
7. MINIMAL MR
8. THE LV EJECTION FRACTION IS 59 %
9. NORMAL LV SYSTOLIC WALL MOTION.
10. ATRIAL SEPTUM ANEURYSM
11. PLEURAL EFFUSION, L'T
1. THERE IS TORTUOSITY OF THE T-AORTA.
2. THE HEART SIZE IS IN MILD DEGREE ENLARGEMENT.
3. THERE ARE ALSO EVIDENCE OF INCREASED INFILTRATIONS OVER BOTH LOWER LUNG FIELDS.
4. INPROPER INFLATION OF BOTH LUNG ARE ALSO NOTED.
5. SCOLIOSIS AND DJD IN THROACO-LUMBAR SPINE.
6. THERE IS REFLEX ILEUS FOUND IN LEFT UPPER ABDOMEN.
Rate: Age not entered, assumed to be 50 years old for purpose of ECG interpretation
PR: 170 Sinus tachycardia
QRSd: 93 Left anterior fascicular block
QT: 322 Low voltage, extremity leads
QTc: 428 Abnormal R-wave progression, late transition

Axes:
P: 21
QRS: -79
T: 55
Ascites tapping

WBC: 2440 /CUMM, RBC: 1560 /CUMM, NEU: 43, LYM: 26, EOS: 1, NBC: 30, Alb 2.1 g/dl (Serum Alb 3.1 g/dl, SAAG 1.0) Pro: 4500 mg/dl, LDH: 194 U/l, Glu: 73 mg/dl, AMY 23 U/L,

Ascites culture: no bact. growth for 7 days.

Ascites cytology: reactive mesothelial cell
## Ascites etiology

<table>
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<tr>
<th>Portal hypertension related</th>
<th>Nonportal hypertension related</th>
</tr>
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<tbody>
<tr>
<td><strong>SAAG ≥1.1</strong></td>
<td><strong>SAAG &lt; 1.1</strong></td>
</tr>
<tr>
<td><strong>Sinusoidal</strong></td>
<td></td>
</tr>
<tr>
<td>cirrhosis (81%), including SBP</td>
<td>Peritonitis: TB, ruptured viscus (↑ amy)</td>
</tr>
<tr>
<td>acute hepatitis</td>
<td>Peritoneal carcinomatosis</td>
</tr>
<tr>
<td>extensive malignancy (HCC or mets)</td>
<td>Pancreatitis</td>
</tr>
<tr>
<td><strong>Postsinusoidal</strong></td>
<td></td>
</tr>
<tr>
<td>right-sided CHF incl. constriction &amp; TR</td>
<td>Vasculitis</td>
</tr>
<tr>
<td>Budd-Chiari syndrome, SOS</td>
<td>Hypoalbuminemic states: nephrotic</td>
</tr>
<tr>
<td><strong>Presinusoidal (a/w varices &gt; ascites)</strong></td>
<td>syndrome, protein-losing enteropathy</td>
</tr>
<tr>
<td>portal or splenic vein thrombosis, schisto</td>
<td>Meigs’ syndrome (ovarian tumor)</td>
</tr>
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<td></td>
<td>Bowel obstruction/infarction</td>
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<td>Postoperative lymphatic leak</td>
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### Table 91-1 Causes of Ascites

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<tr>
<th>CAUSE</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cirrhosis (with or without infection)</td>
<td>85</td>
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<tr>
<td>Miscellaneous portal hypertension-related disorder</td>
<td>8</td>
</tr>
<tr>
<td>(including 5% with two causes)</td>
<td></td>
</tr>
<tr>
<td>Cardiac disease</td>
<td>3</td>
</tr>
<tr>
<td>Peritoneal carcinomatosis</td>
<td>2</td>
</tr>
<tr>
<td>Miscellaneous nonportal hypertension-related disorders</td>
<td>2</td>
</tr>
</tbody>
</table>
OPD survey v.s. Admission survey

Lung v.s. Heart v.s. Abdomen

Benign disease ? v.s. Malignant disease ?
Q6. What’s your impression and suggestion for the next step
2013. 03. 28  Ascites tapping

WBC: 2440 /CUMM, RBC: 1560 /CUMM, NEU: 43, LYM: 26, EOS: 1, NBC: 30, Alb 2.1 g/dl (Serum Alb 3.1 g/dl, SAAG 1.0) Pro: 4500 mg/dl, LDH: 194 U/l, Glu: 73 mg/dl, AMY 23 U/L,

Ascites culture: no bact. growth for 7 days.
Ascites cytology: reactive mesothelial cell
ADA: 63U/L, AFS: not found
Q7. How many samples are needed for detection of mycobacterium tuberculosis
Admission to GI ward

Serial examination

- **2013. 04. 14**
  - Admission to GI ward

- **2013. 04. 15**
  - Serial examination
  
  Sputum AFS : not found x 3 sets
  Urine AFS : not found
  Stool AFS : not found
  Quantiferon-TB assay: Indeterminate
    - TB Ag minus Nil : 0.33 IU/mL
    - Mitogen minus Nil : 0.30 IU/mL
  Sputum culture : normal mixed flora
  Ascites:
    - WBC 103 /CUMM, RBC 274 /CUMM
    - NEU: 2, LYM: 93, NBC: 5. AFS: not found
    - ALB 1.7 g/dl (serum Alb 2.5 g/dl, SAAG 0.8), GLU 85 mg/dl, PRO 3800 mg/dl, LDH 215 U/l, AMY 17 U/L, TG 25 mg/dl
  Ascites culture: no bact. Growth for 7 days
Diagnostic tools-
Acid fast smear and culture -1

• The standard tool for the diagnosis: Acid fast culture of tissue, fluid, or drainage from an infected locus.
  – Acid-fast microscopy: may support diagnosis, esp if organisms or caseating granulomas are seen.
  – Smears for acid fast bacilli were positive in a minority of patients when only a single site was sampled.
    • The probability of a positive smear increased with the number of sites sampled.
    • Samples of multiple sites (sputum, gastric aspirate, pleural fluid, ascites, urine) should be examined for the presence of acid-fast bacilli.

UpToDate: Clinical manifestations, diagnosis, and treatment of extrapulmonary and miliary TB, 2012,10
# Positive smear or culture in miliary TB

<table>
<thead>
<tr>
<th>Site</th>
<th>Maartens, 1990</th>
<th>Kim, 1990</th>
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<tbody>
<tr>
<td>Sputum smear</td>
<td>33*</td>
<td>36</td>
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<tr>
<td>Sputum culture</td>
<td>62</td>
<td>76</td>
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<tr>
<td>BAL smear</td>
<td>27</td>
<td>9</td>
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<tr>
<td>BAL culture</td>
<td>55</td>
<td>54</td>
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<tr>
<td>Gastric aspirate smear</td>
<td>43</td>
<td>0</td>
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<tr>
<td>Gastric aspirate culture</td>
<td>100</td>
<td>75</td>
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<tr>
<td>Urine smear</td>
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<tr>
<td>Urine culture</td>
<td>33</td>
<td>59</td>
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<tr>
<td>CSF smear</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>CSF culture</td>
<td>60</td>
<td>0</td>
</tr>
<tr>
<td>Serosal smear</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Serosal culture</td>
<td>44•</td>
<td>14△</td>
</tr>
</tbody>
</table>

* All numbers are percentages.  
• 9 ascites, 7 pleural, 2 pericardial.  
△ All pleural.  


UpToDate: Clinical manifestations, diagnosis, and treatment of extra-pulmonary and miliary TB, 2012,10
Diagnostic tools-
Acid fast smear and culture -2

• Gastric aspirate cultures were frequently positive.
  – Not clear how often they were positive when sputum smears were negative.
  – Obtain gastric aspirates if sputum smears are not available or negative.

• Bronchoscopy if acid-fast bacilli are not detected at multiple sites (sputum, gastric aspirate, pleural fluid, ascites, urine)
  – Most useful when pulmonary involvement on CXR.
  – In subacute or chronic presentation with negative sputum smears → delay bronchoscopy until cultures are negative for one to two weeks, particularly if a rapid diagnostic assay is available.
  – In acute presentation or in the absence of rapid diagnostic tools, prompt bronchoscopy is warranted.

UpToDate: Clinical manifestations, diagnosis, and treatment of extrapulmonary and miliary TB, 2012,10

Willcox PA, et al. Thorax 1986; 41:681
Diagnostic tools-
Acid fast smear and culture -3

• Smears should be stained with the acid-fast fluorochrome dye, auramine-O (more sensitive than the conventional Ziehl-Nielsen stain).

  – Rapid probes can be applied to smear-positive sputum specimens to confirm the diagnosis of M. tuberculosis.

  – Specimens is inoculated into a commercial automated radiometric detection system (BACTEC, Becton Dickson) (faster and more sensitive than standard techniques using solid medium for the isolation of M. tuberculosis.)

  – D/D M. tuberculosis from commonly isolated NTB by hybridization using nucleic acid probes on the liquid medium.

UpToDate: Clinical manifestations, diagnosis, and treatment of extrapulmonary and miliary TB, 2012,10


Q8. What’s your suggestion for the next step
Diagnosis of TB peritonitis - 1

- Considered in all patients presenting with unexplained lymphocytic ascites with a serum-ascites albumin gradient of <1.1 g/dL.

- The gold-standard for diagnosis: Culture growth of Mycobacterium on ascitic fluid or a peritoneal biopsy.

- Usually requires a peritoneal biopsy performed under direct visualization. (laparoscopy or mini laparotomy)

- Low success rate and complications including death in blinded performed biopsies.
Diagnosis of TB peritonitis - 1

– Visual diagnosis during laparoscopy or mini-laparotomy can be diagnostic in up to 95 percent of cases.

– Typically, the visceral and parietal peritoneum is studded with multiple whitish nodules or tubercles.

– Other findings include enlarged lymph nodes, "Violin-string" fibrinous strands, and omental thickening.


– Targeted biopsies reveal caseating granulomas in up to 100 percent of patients and are positive for acid fast bacilli in 74 percent of patients.

Diagnosis of TB peritonitis - 2

• Routine laboratory studies
  – Nonspecific.
    • A normal leukocyte count is present in most patients.
    • A mild normocytic, normochromic anemia is present in approximately 50 percent of patients.
  – Increased serum CA-125 concentrations.
    • In some cases, the elevated levels combined with the clinical and radiologic picture can mimic ovarian cancer.
    • Serum CA-125 can be increased in ascites due to any cause.
  – Do not measure serum CA-125 in the evaluation of patients with ascites.


UpToDate: Tuberculous peritonitis, 2012,10
Diagnosis of TB peritonitis - 3

• Tuberculin skin testing
  – Tuberculin testing with purified protein derivative (PPD) is positive in approximately 70 percent of patients
  – However a negative result is of no help in excluding the disease.
  – Patients with a known previous skin reaction to TB may be anergic at the time of PPD reading.


UpToDate: Tuberculous peritonitis, 2012,10
Diagnosis of TB peritonitis - 4

• Radiologic imaging
  – Evidence of old tuberculosis on CXR
    • 20 to 30 % of patients while features of active tuberculosis are much less common.
  – Peritoneal thickening, omental caking, and the presence of ascites with fine mobile septations on ultrasound and CT imaging may suggest the diagnosis.

• The most common CT findings: the combination of ascites, peritoneal lesions and lymphadenopathy.

– Isolated reports of intense FDG-activity on PET scanning in peritoneal TB mimicking peritoneal carcinomatosis.
Diagnosis of TB peritonitis - 5

• Peritoneal fluid analysis
  – Ascitic leukocyte count of 150 to 4000 mm$^3$, with a relative lymphocytic pleocytosis.
  – Interestingly, CAPD patients with tuberculous peritonitis may have a neutrophilic response.

  • Protein usually >3.0 g/dL.  

  • In patients without underlying cirrhosis
    • SAAG <1.1 g/dL.
    • Up to one-half of patients have underlying cirrhosis and therefore have a SAAG ≥1.1.


Diagnosis of TB peritonitis - 5

– Acid fast stained smear of ascitic fluid: low yield.
  • Direct smear for Ziehl-Neelson stain: sensitivity of 0 to 6 %.
    
  
  
  

– A positive ascites culture: less than 20%.
  • The utility of cultures is even more questionable when considering the delay of four to six weeks before a result is obtained. (increased mortality).
    
  
  
  

  • The yield of culture may be increased to 83% if 1 liter of ascitic fluid, concentrated by centrifugation, is cultured

  – But this has not yet been confirmed and is not practical since such large culture volumes are not performed routinely by most clinical laboratories.
    
  
  
  

  UpToDate: Tuberculous peritonitis, 2012,11
Diagnosis of TB peritonitis - 6

• Polymerase chain reaction
  – PCR assays, which amplify mycobacterial 16S ribosomal RNA, show promise of rapid detection of mycobacteria.
  • However, the utility of ascitic fluid PCR assays in detecting TB peritonitis has not been well established.


– Review of 11 cases of abdominal tuberculosis revealed a positive PCR for M. Tuberculosis of the ascitic fluid in all cases, suggesting a role for PCR analysis prior to surgical intervention.


UpToDate: Tuberculous peritonitis, 2012,11
Diagnosis of TB peritonitis - 7

• Adenosine deaminase
  • A purine-degrading enzyme that is necessary for the maturation and differentiation of lymphoid cells.
  – Been proposed as a useful non-culture method of detecting tuberculous peritonitis.
  • Greatest utility in settings where TB peritonitis is suspected in non-cirrhotic patients.
  – Meta-analysis (12 prospective studies, 264 patients): high sensitivity (100 %) and specificity (97 %) using cut-off values from 36 to 40 int. unit/L; the optimal cut-off value was 39 int. unit/L .
  – The sensitivity is substantially lower in patients with cirrhosis (approximately 30 %) due to the characteristically poor humoral and T cell mediated response of cirrhotic patients.

Diagnosis of TB peritonitis - 8

• T-cell based testing for mycobacterium tuberculosis (ELISPOT)
  • An FDA approved enzyme-linked immunospot assay (ELISPOT), measuring gamma producing T-cell responses to early secreted antigenic targets of mycobacterium tuberculosis
  – 72 patients reported the sensitivity and specificity of ELISPOT in the diagnosis of extrapulmonary TB as 94 and 88 percent, respectively.


• The ELISPOT assay on peripheral blood or ascitic fluid may prove to be a useful adjunct in the diagnosis of active TB but is not available in many institutions within the United States and additional data are needed.
Repeat abdominal CT due to dyspnea

1. Moderate ascites with peritoneum thickening and omental cake, peritoneal carcinomatosis can not be ruled out, D/D: methothelioma, peritonitis...
2. Moderate bil. pleural effusion with atelectasis of bil. lower lungs.
3. Patency of main portal vein and its major branches.
4. No obvious enlarged lymphadenopathy at paraaortic retroperitoneum.
5. Small gall stones at gall bladder.
Impression:
1. Suspect TB pericarditis and peritonitis
2. Bilateral pleural effusion, suspect sec. to the constrictive pericarditis

Suggestion:
1. Consult GS for omentum biopsy. (No value for pleural biopsy because it would be sec. to constrictive pericarditis.)
2. Higher risk for the pericardium biopsy
3. Empirically try Anti-TB medication if the patient refuse surgical biopsy. (Not favorable due to no bacterial drug sensitivity result and proof.)
-2013. 04. 16  Thoracentesis
RBC  1188 /CUMM, WBC 1574 /CUMM
NEU 25, LYM 28, MON 22, NBC: 25
PRO  3500 mg/dl, LDH 129 U/l,
GLU 100 mg/dl
Culture: no growth
AFS: not found, ADA: 47 U/L
Cytology: Negative for malignant cell

-2013. 04. 17

CA-199 : 11.64 Unit/ml (<34.0 Unit/ml)
Ca-125 : 316 Unit/ml (<35.0 Unit/ml)
PSA : 5.23 ng/ml (< 4.0 ng/ml)
-2013. 04. 17  Dyspnea
   Intermittent ascites tapping.
   NT-pro BNP: 2250 pg/mL
   (< 75y/o 125pg/mL, ≧ 75 y/o 450 pg/mL)

-2013. 04. 18  GS consultation
   Abdominal CT found bilateral pleural effusion with much ascites and suspect carcinomatosis. Elevated CA-199 was noted. I'll discuss with attending VS about surgical abdominal biopsy.

-2013. 04. 18  Fever up to 38 degree, mild chills
~2013.04. 25  Augmentin → Cefoperazone + MaxTAM
-2013. 04. 23  Pig-tail insertion over left side for drainage of pleural effusion.
   Schedule: minilaparotomy for omentum bx
2013. 03. 29 Report of ascites culture
*Mycobacterium tuberculosis* (TB complex)

Hold elective surgery of minilaparotomy for omentum biopsy

Predictone 20 MG PO BID
Vit B6 tab 50mg 1 TAB PO TID
E.M.B. tab 400mg 3 TAB PO QD
RIFinah 300 tab 2 TAB PO QD AC

CM transfer

<table>
<thead>
<tr>
<th>Drug</th>
<th>SM</th>
<th>SM</th>
<th>INH</th>
<th>INH</th>
<th>RIF</th>
<th>EMB</th>
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<th>PAS</th>
<th>K</th>
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<tr>
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<td>6.0</td>
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<td>8.0</td>
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</tr>
</tbody>
</table>
Suggestion:
1. If pericardiectomy is considered, you should have evidence of "constriction". At present, the CT film and echo only revealed minimal pericardial effusion. The thickening of pericardium is to be determined and the evidence of constriction is not obvious. Before considering pericardiectomy, please consult CV to make sure it is constriction that needs to be treated.
2. We can offer pericardial biopsy as needed.
-2013. 05. 17  Discharge

1. Active pulmonary tuberculosis, TB peritonitis, and suspect TB pericarditis, (sputum culture(+) x 3), moderately advanced, s/p E.M.B. +RIFinah since 4/25
2. Restrictive pericarditis with pericardial effusion and bilateral pleural effusion, highly suspected TB pericarditis
3. Reflux esophagitis LA Gr.A
4. Hypertension
5. Traumatic ICH history 15 years ago
6. Cerebral aneurysm history
7. Vertebraobasilar artery syndrome
8. Cervical spondylosis with osteophytes formation
9. Hyperlipidemia
Take home message

• D/D of chest pain, heartburn, liver disease, and ascites from detailed, organized history taking and physical examination.

• Diagnostic tools for TB peritonitis.